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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/698,736	10/26/2000	Shahram Mostafazadeh	NSC1P194/P04836	7520

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EXAMINER

THAI, LUAN C

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 10/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/698,736

Applicant(s)

MOSTAFAZADEH, SHAHRAM

Examiner

Luan Thai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 7/16/02
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

This Office action is responsive to the amendment filed July 16, 2002.

Claims **11-20** and newly added claims **21-22** are pending in this application.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-14 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (5,830,800) in view of Shinohara (6,358,778 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 11-14, Lin teaches (specifically see figures 1A-1G, Col. 2) a method for packaging integrated circuits, comprising: providing a lead frame of a conductive material with an array of lead posts 30 that are equally spaced apart and a connecting sheet 10 connecting each of the lead posts 30; attaching a plurality of first dice 40 to the lead posts, and electrically and mechanically connecting the first dice to a plurality of lead posts 30 within the array of lead posts via wires 41, encapsulating the dice with an encapsulating material 50, removing the connecting sheet 10 to electrically isolated the plurality of lead

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posts from each other, and singulating the encapsulating first dice. Lin fails to teach a conductive side of the first dice facing and electrically connected the lead posts via a conductive epoxy.

Shinohara teaches while related to a similar method for packaging integrated circuits (see specifically figures 4A-4C, Col. 5, lines 34+ and Col. 6, lines 1+) teaches a method comprising the steps: providing a lead frame (1-2) of conductive material with an array of lead posts 2 and a connecting sheet 1 connecting the array of lead posts 2; electrically and mechanically attaching first die 4 with a conductive side of the die facing the plurality of lead posts of the lead frame, wherein the step of attaching die 4 to the lead frame comprises placing a conductive epoxy 12 between conductive pads on the die and the lead posts 2; and encapsulating the die with an encapsulating material 7. The method further comprises the step of removing the connecting sheet 1 to electrically isolate the plurality of lead posts from each other (figures 3A-4B, Col. 6, lines 1+). In fact, Shinohara teaches chip 7 can electrically connected to the array of lead posts 2 by using either bonding wires 5 (see figures 1A-1C and 2-3) or conductive bump 12 (e.g., flip chip technique). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the electrical connections between the dice 40 and the array of lead posts 30 in Lin 's device package by using conductive bump, instead of using bonding wires, since such electrical connection is conventional in the art, as taught by Shinohara.

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Regarding claims 21-22, Lin further discloses that the number of lcs simultaneously by one flow of the process can be more than 2 (Col. 1, lines 65-67, and Col. 2, lines 1-2), and thus, the claimed limitation of "the array of posts is at least ten by ten in size" is taken to be inherent in Lin's device package.

3. Claims 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (5,830,800) in view of Shinohara (6,358,778 of record) and further in view of Nakashima et al. (5,075,760 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 15, the proposed method of Lin and Shinohara teaches all the steps of the claimed invention as detailed above except for a step of testing the integrated circuit packages before the step of singulation.

Nakashima et al. while related to a similar method of making integrated circuit packages teach the step of package testing being performed before the step of singulation (Col. 4, lines 25+, figures 1-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Nakashima et al.'s teachings to the proposed method of Lin and Shinohara in order to verify the defected package.

The further citations of claims 16-19 would have been obvious for the similar reasons set forth in the discussion of claims 11-14 above.

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4. Claim 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (5,830,800) in view of Shinohara (6,358,778 of record) and further in view of Wang et al. (6,258,626 of record).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claim 20, the proposed method of Lin and Shinohara teaches all the steps of the claimed invention as detailed above except for the step of attaching a plurality of second dice to the plurality of first dice, wherein each second die has a conductive side and a side opposite the conductive side, wherein the side opposite the conductive side of each second die is connected to a side opposite the conductive side of the first die, and wherein wires are bonded conductive pads of second dice to lead posts.

Wang et al. while related to a similar method of making integrated circuit packages teach (figures 1-8, specifically see figures 3-8) a method of making a stacked chip package comprising a step of attaching a first die 110 to the lead posts 124, wherein the first die 110 is flip-chip bonded to the lead posts 124; back-to-back attaching a second die 130 to the first die 110, wherein wires 132 are bonded the conductive pads on the conductive side of the second die 130 to the lead posts 122. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Wang et al.'s teachings to the proposed method of Lin and Shinohara by back-to-back attaching a plurality of second dice to the plurality of first dice, wherein wires are used to electrically

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connect the conductive pads on the conductive side of the second die to the lead posts of the lead frame in order to form stacked chip packages.

5. Tamaki et al (6,157,080 of record) also teach a process of making a stacked chip package identical to Wang et al.'s process; therefore, claim **20** is also rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (5,830,800) in view of Shinohara (6,358,778 of record) and further in view of Tamaki et al. for the similar reasons detailed above.

### ***Conclusion***

6. Applicant's arguments with respect to claims **11-22** have been fully considered, but they are deemed to be moot in view of the new grounds of rejection.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action because the underlined portions of independent claim 11 raise new issues that would require further consideration and/or search. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Luan Thai  
October 14, 2002

*Albert W. Paladini 10-16-02*  
**ALBERT W. PALADINI**  
**PRIMARY EXAMINER**